UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/587,078	06/02/2000	Bernard Traversat	5181-63200	7307

		EXAMINER
7590	03/25/2004	ANYA, CHARLES E

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ART UNIT	PAPER NUMBER
2126	8

DATE MAILED: 03/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/587,078	TRAVERSAT ET AL.
	Examiner	Art Unit
	Charles E Anya	2126

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3/</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *9/17/01*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-110* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-110* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date *#5*.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

DETAILED ACTION

1.   Claims are 1 – 110 are pending in the instant application.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims 1-12,14-16,18-26,28-30,32-40,42-50,52-54,56-64,66-68,70-78,80-86,88-

90,92-97,99-101,103-108 and 110 are rejected under 35 U.S.C. 103(a) as being

unpatentable over U.S. Pat. No. 6,421,739 B1 to Holiday in view of U.S. Pat. No.

6,401,216 B1 to Meth et al.

4.   As to claim 1, Holiday teaches a method for checkpointing processes on a virtual

machine execution with a device, the method comprising: executing a process within

the virtual machine (figure 1 Col. 2 Ln. 46 – 67, Col. 3 Ln. 1 – 67), wherein the virtual

machine comprises a virtual machine virtual memory manager, wherein said executing

the process comprises: the process referencing an object in a virtual heap during

execution, wherein the virtual heap comprises an in-memory heap and a store heap,

wherein (Heap Memory 32/Heap Memory 42 Col. 3 Ln. 1 – 67, Col. Col. 10 Ln. 1 – 16),

the process accessing the referenced object in the in-memory heap (figure 2 (Step 214)

Col. 5 Ln. 1 – 35) and checkpointing a state of the process executing on the virtual

machine to a first memory space, wherein said checkpointing comprises the virtual

machine virtual memory manager flushing one or more sections of the in-memory heap

to the store heap (figure 2 (Step 224) Col. 5 Ln. 65 – 67, Col. 6 Ln. 1 – 64).

5.   Holiday is silent with respect to step of: if the referenced object is in the store

heap and not in the in memory heap when referenced by the process, the virtual

machine virtual memory manager copying a section of the store heap comprising the

referenced object from the store heap to the in-memory heap.

6.   Meth teaches the step of: if the referenced object is in the store heap and not in

the in memory heap when referenced by the process, the virtual machine virtual

memory manager copying a section of the store heap comprising the referenced object

from the store heap to the in-memory heap ("...loaded..." Col. 6 Ln. 16 – 43).

7.   It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine the teachings of Meth and Holiday because the

teaching of Meth would improve the system of Holiday by executing a process (Col. 6

Ln. 16 – 17).

8.   As to claim 2, Holiday teaches the method of claim 1, wherein the one or more

flushed sections comprise new objects or modified objects in regards to objects stored

in the store heap prior to said flushing (figure 2 Col. 6 Ln. 1 – 56).

9.   As to claim 3, Holiday teaches the method of claim 1, wherein said checkpointing

the state of the process executing on the virtual machine to the first memory space

comprises storing data describing one or more leases to services for the process,

wherein the one or more services are external to the virtual machine on which the

process is executing, and wherein the leases are grants of access to the one or more

services ("...JVM..." Col. 3 Ln. 49 – 62).

10.   As to claim 4, Holiday teaches the method of claim 3, wherein said checkpointing

the state of the process executing on the virtual machine to the first memory space

further comprises storing a computation state of the virtual machine to the first memory

space, wherein the computation state of the virtual machine comprises information

about the execution state of the process on the virtual machine (figure 2 (Step 212) Col.

5 Ln. 9 – 16, Col. 6 Ln. 1 – 8).

11.   As to claim 5, Holiday teaches the method of claim 1, further comprising:

repeating said checkpointing the state of the process so that the first memory space

stores a plurality of states for the process, and wherein each of the plurality of states for

the process stored in the first memory space is a unique state of the process on the

virtual machine (figure 2 (Step 204/218) Col. 5 Ln. 36 – 46, Col. 7 Ln. 8 – 67, Col. 8 Ln.

1 – 36).

12.   As to claim 6, Holiday teaches the method of claim 1, wherein said

checkpointing the state of the process executing on the virtual machine to the first

memory space comprises storing a computation state of the virtual machine to the first

memory space, wherein the computation state of the virtual machine comprises

information about the execution state of the process on the virtual machine ("...program

state..." Col. 6 Ln. 1 – 8).

13.   As to claim 7, Holiday teaches the method of claim 1, wherein the store heap for

the process is one of a plurality of store heaps for a plurality of processes on the virtual

machine (Col. 9 Ln. 59 – 65).

14.   As to claim 8, Holiday teaches the method of claim 1, wherein the checkpointed

state of the process is one of a plurality of checkpointed states in the first memory

space for a plurality of processes on the Virtual machine (figure 2 (Step 224) Col. 5 Ln.

65 – 67, Col. 6 Ln. 1 – 56).

15.   As to claim 9, Holiday teaches the method of claim 1, wherein the device is a

network client device (figure 1 Col. 2 LIn. 46 – 56).

16.   As to claim 10, Holiday teaches the method of claim 1, wherein the first memory

space is comprised in a first memory device coupled to the device (figure 1 Col. 2 Ln.

46 – 67).

17.   As to claim 11, Holiday is silent with respect to the method of claim 10, wherein

the first memory device is coupled to the device via the Internet so that the virtual

machine virtual memory manager writing the one or more sections of the in-memory

heap to the store heap comprised in the first memory space occurs over the Internet.

18.   Meth teaches the method of claim 10, wherein the first memory device is coupled

to the device via the Internet so that the virtual machine virtual memory manager writing

the one or more sections of the in-memory heap to the store heap comprised in the first

memory space occurs over the Internet ("...Internet address..." Col. 10 Ln. 47 – 61).

19.   It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine the teachings of Meth and Holiday because the

teaching of Meth would improve the system of Holiday by providing process migration

(Col. 10 Ln. 51 – 61).

20.   As to claim 12, Holiday teaches the method of claim 1, wherein the first memory

space is comprised in a non-volatile memory (Step 230 Col. 10 Ln. 8 – 16).

21.   As to claim 14, Holiday teaches the method of claim 1, wherein the virtual

machine is a Java virtual machine, and wherein the process is a Java application (figure

1 Col. 2 Ln. 45 – 67).

As to claim 15, Holiday teaches a method for managing processes on a virtual machine executing within a device, the method comprising: executing a process within the machine checkpointing a state of the process on the machine to a persistent store (Step 224 – 230 Col. 5 Ln. 65 – 67, Col. 6 Ln. 1 – 56) and expiring one or more leases to services for the first process on the virtual machine (Garbage Collection Functions 36/46 Col. 3 Ln. 10 – 26).

22.   Holiday is silent with respect to stopping the process execution on the virtual machine, reading the stored state of the process from the persistent store/reconstituting the stored state of the process on the virtual machine/establishing the one or more leases to services for the process on the virtual machine and resuming the process execution on the virtual machine.

23.   Meth teaches stopping the process execution on the virtual machine (figure 9 Col. 8 Ln. 44 – 67, figure 10 (Step 1006) Col. 10 Ln. 47 – 61), reading the stored state of the process from the persistent store/reconstituting the stored state of the process on the virtual machine/establishing the one or more leases to services for the process on the virtual machine and resuming the process execution on the virtual machine (figure 10 (Step 1008 – 1106) Col. 10 Ln. 62 – 67, Col. 11 Ln. 1 – 65).

24.   It would have been would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Meth and Holiday because the teaching of Meth would facilitate recovery from a system failure (Col. 6 Ln. 49 – 53).

25.   As to claim 16, Holiday as modified is silent with respect to the method of claim 15, further comprising: stopping execution of the virtual machine within the device consequent to said stopping the process execution on the virtual machine (and restarting execution of the virtual machine within the device prior to said reading the stored state of the process from the persistent store.

26.   Meth teaches the method of claim 15, further comprising: stopping execution of the virtual machine within the device consequent to said stopping the process execution on the virtual machine (figure 9 Col. 8 Ln. 44 – 67) and restarting execution of the virtual machine within the device prior to said reading the stored state of the process from the persistent store (figure 10 Col. 10 Ln. 41 – 67, Col. 11 Ln. 1 – 15).

27.   It would have been would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Meth and Holiday because the teaching of Meth would facilitate recovery from a system failure (Col. 6 Ln. 49 – 53).

28.   As to claim 18, Holiday teaches the method of claim 15, wherein the state of the process comprises: a heap for the process, wherein the heap comprises code and data for the process executing on the virtual machine (Memory Heap 32/42 Col. 5 Ln. 1 – 34).

29.   As to claim 19, Holiday is silent with respect to the method of claim 15, wherein the state of the process comprises: data describing the one or more leases to services for the process on the virtual machine, wherein the data describing the one or more

leases is used in said establishing the one or more leases to services for the process on

the virtual machine.

30.   Meth teaches to the method of claim 15, wherein the state of the process

comprises: data describing the one or more leases to services for the process on the

virtual machine, wherein the data describing the one or more leases is used in said

establishing the one or more leases to services for the process on the virtual machine

(figures 12/13 Col. 12 Ln. 23 – 67).

31.   It would have been obvious to one of ordinary skill in the art at the time the

invention was to combine the teachings of Meth and Holiday because the teaching of

Meth improves the system of Holiday by implementing process migration (Col. 12 Ln. 37

– 47).

32.   As to claim 20, Meth teaches the method of claim 15, wherein the one or more

leases to services include one or more leases to remote services, wherein the remote

services are services provided on devices other than the device within which the

process is executing (figure 12 Col. 12 Ln. 22 – 47).

33.   As to claim 21, Meth teaches the method of claim 15, wherein the one or more

leases to services include one or more leases to local services, wherein the local

services are services provided on the device within which the process is executing

(figure 13 Col. 12 Ln. 48 – 67).

34.   As to claim 22, Holiday is silent with respect to the method of claim 15, wherein

the one or more leases to services include one or more leases to system services,

wherein a system service comprises system code for accessing a resource external to

the process, wherein the system code is provided on the device within which the

process is executing.

35.   Meth teaches the method of claim 15, wherein the one or more leases to

services include one or more leases to system services, wherein a system service

comprises system code for accessing a resource external to the process, wherein the

system code is provided on the device within which the process is executing (System

Kernel 306 Col. 6 Ln. 23 – 28).

36.   It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine the teachings of Meth and Holiday because the

teaching of Meth would improve the system of Holiday by providing system services

(Col. 6 Ln. 23 – 28).

37.   As to claim 23, Meth teaches the method of claim 15, wherein the state of the

process comprises: a stored execution state of the device comprising the virtual

machine wherein, in said reconstituting the state of the process on the virtual machine,

a current execution state of the device comprising the virtual machine is reconstituted to

the stored execution state of the device (figure 10 (Step 1008 – Step 1012) Col. 10 Ln.

62 – 67, Col. 11 Ln. 1 – 51).

38.   As to claim 24, Holiday teaches the method of claim 15, wherein the persistent

store comprises a plurality of persistent heaps for a plurality of processes and wherein

said checkpointing the state of the process on the virtual machine to the persistent store

comprises: checkpointing the state of the process on the virtual machine to a first

persistent heap for the process in the plurality of persistent heaps comprised in the

persistent store (figure 2 (Step 228) Col. 6 Ln. 32 – 51, Col. 9 Ln. 59 – 65).

39.   As to claim 25, Holiday teaches the method of claim 15, wherein the virtual

machine comprises a first in-memory heap for caching pages for use by the process,

wherein the pages comprise code and data for the process (Heap Memory 32 Col. 3 Ln.

3 – 26, Col. 4 Ln. 1 – 20) wherein the persistent store comprises a virtual heap for

storing pages flushed from the first in-memory heap and wherein said checkpointing the

state of the process on the virtual machine to the persistent store comprises: storing

one or more pages from the first in-memory heap to the virtual heap in the persistent

store (figure 2 (Step 228) Col. 6 Ln. 32 – 51).

40.   As to claim 26, Hoilday teaches the method of claim 25, wherein said stopping

the process execution on the virtual machine comprises: deleting the first in-memory

heap from the virtual machine ("...deleted..." Col. 6 Ln. 1 – 8).

41.   As to claim 28, see the rejection of claim 14.

As to claim 29, Holiday teaches a method for managing processes on a virtual machine executing within a device, the method comprising: executing a process first process within the virtual machine, checkpointing a state of the first process on the virtual machine to a persistent store (Step 224 – 230 Col. 5 Ln. 65 – 67, Col. 6 Ln. 1 – 56) and expiring one or more leases to services for the first process on the virtual machine (Garbage Collection Functions 36/46 Col. 3 Ln. 10 – 26).

42.   Holiday is silent with respect to suspending the first process execution on the virtual machine, reading a state of a suspended second process from the persistent store, wherein the state of the second process was stored to the persistent store prior to said executing the first process within the virtual machine, reconstituting the stored state of the second process on the virtual machine, establishing the one or more leases to services for the process on the virtual machine and resuming the process execution on the virtual machine.

43.   Meth teaches suspending the first process execution on the virtual machine (figure 900 (Step 900) Col. 8 Ln. 44 – 67), reading a state of a suspended second process from the persistent store, wherein the state of the second process was stored to the persistent store prior to said executing the first process within the virtual machine reconstituting the stored state of the second process on the virtual machine/establishing the one or more leases to services for the process on the virtual machine and resuming the process execution on the virtual machine (Step 1012 - 1100) Col. 11 Ln. 1 – 54).

44.   It would have been would have been obvious to one of ordinary skill in the art at

the time the invention was made to combine the teachings of Meth and Holiday because

the teaching of Meth would facilitate recovery from a system failure (Col. 6 Ln. 49 – 53).

45.   As to claims 30,32 - 37, see the rejection of claims 16,18 – 23 respectively.

46.   As to claim 38, Holiday teaches the system of claim 67, wherein the persistent

memory device comprises a plurality of persistent heaps for a plurality of processes

(figures 1/3) and wherein, in checkpointing the state of the first process executing within

the virtual machine to the persistent memory device, the virtual machine process

manager is further configured to: checkpoint the state of the first process on the virtual

machine to a first persistent heap for the first process in the plurality of heaps comprised

in the persistent memory device (Col. 9 Ln. 59 – 65).

47.   Holiday is silent with reference to reading the state of the second process from

the persistent memory device, the virtual machine process manager is further

configured to: read the state of the second process from a second persistent heap for

the second process in the plurality of heaps comprised in the persistent memory device.

48.   Meth teaches reading the state of the second process from the persistent

memory device, the virtual machine process manager is further configured to: read the

state of the second process from a second persistent heap for the second process in

the plurality of heaps comprised in the persistent memory device (figure 10 (Step 1012)

Col. 10 Ln. 62 – 67, Col. 11 Ln. 1 – 15).

49.   It would have been would have been obvious to one of ordinary skill in the art at

the time the invention was made to combine the teachings of Meth and Holiday because

the teaching of Meth would facilitate recovery from a system failure (Col. 6 Ln. 49 – 53).

50.   As to claims 39 and 40, see the rejection of claims 25 and 26 respectively.

51.   As to claim 42, see the rejection of claim 14.

52.   As to claim 43, Holiday teaches a system comprising: a device configured to

execute a virtual machine, wherein the virtual machine is configured to execute a first

process (figure 2 Col. 5 Ln. 1 – 35), a first memory coupled to the device, wherein the

first memory is configured to store a store heap for the first process, and wherein the

first memory is further configured to store one or more checkpointed states of one or

more processes, wherein the store heap is comprised within a virtual heap for the first

process (JVM 40 figure 2 Col. 5 Ln. 1 – 67, Col. 6 Ln. 1 – 64), a second memory

coupled to the device, wherein the second memory is configured to store an in-memory

heap for the first process, and wherein the in-memory heap is comprised within the

virtual heap (JVM 30 figure 2 Col. 5 Ln. 1 – 67, Col. 6 Ln. 1 – 64), and wherein the

in-memory heap comprises cached portions of the store heap for access by the first

process (NOTE: Although this limitation is not explicitly taught, cache portion/line are

inherent in a heap), wherein the first process accesses the referenced object in the

in-memory heap (figure 2 (Step 210 – 222) Col. 5 Ln. 1 – 64), and checkpoint a state

the first process executing on the virtual machine to the first memory, wherein in checkpointing the state of the first process executing on the virtual machine to the first memory, the virtual machine virtual heap manager is further configured to flush one or more sections of the in-memory heap to the store heap (figure 2 (Step 224 – 230) Col. 5 Ln. 65 – 67, Col. 6 Ln. 1 – 56).

53.   Holiday is silent with respect to the device being is configured to perform operations on the virtual heap according to a virtual machine virtual heap manager, and wherein the virtual machine virtual heap manager is configured to copy a section of store heap comprising an object from the store heap to the in-memory heap in response to the first process referencing the object in the virtual heap when the referenced object is in the store heap and not in the in-memory heap.

54.   Meth teaches the device being is configured to perform operations on the virtual heap according to a virtual machine virtual heap manager, and wherein the virtual machine virtual heap manager is configured to copy a section of store heap comprising an object from the store heap to the in-memory heap in response to the first process referencing the object in the virtual heap when the referenced object is in the store heap and not in the in-memory heap ("...loaded..." Col. 6 Ln. 16 – 43).

55.   It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Meth and Holiday because the teaching of Meth would improve the system of Holiday by executing a process (Col. 6 Ln. 16 – 17).

56.   As to claims 44 and 45, see the rejection of claims 2 and 3 respectively.

57.   As to claims 46 and 47, see the rejection of claims 5 and 6 respectively.

58.   As to claim 48, see the rejection of claims 7 and 8.

59.   As to claim 49, see the rejection of claim 9.

60.   As to claim 50, see the rejection of claim 11.

61.   As to claims 52 – 54 and 56 – 62, see the rejection of claims 14 – 16 and 18 – 24

respectively.

62.   As to claims 63 and 64, see the rejection of claims 25 and 26 respectively.

63.   As to claim 66, see the rejection of claim 14.

64.   As to claim 67, see the rejection of claim 29.

65.   As to claim 68, see the rejection of claim 16.

66.   As to claims 70 – 75, see the rejection of claims 18 – 23 respectively.

67.   As to claim 76, see the rejection of claim 38.

68.   As to claims 77 and 78, see the rejection of claims 25 and 26 respectively.

69.   As to claim 80, see the rejection of claim 14.

70.   As to claims 81 and 82, see the rejection of claims 1 and 2 respectively.

71.   As to claim 83, see the rejection of claims 3 and 4.

72.   As to claim 84, see the rejection of claim 5.

73.   As to claim 85, see the rejection of claims 7 and 8.

74.   As to claim 86, see the rejection of claim 10.

75.   As to claim 88, see the rejection of claim 14.

76.   As to claim 89, see the rejection of claim 15.

77.   As to claims 90 and 101, see the rejection of claim 16.

78.   As to claims 92 and 103, see the rejection of claims 18, 19 and 23.

79.   As to claims 93 and 104, see the rejection of claim 20.

80.   As to claims 94 and 105, see the rejection of claim 21.

81.   As to claims 95 and 106, see the rejection of claim 22.

82.   As to claim 96, see the rejection of claim 24.

83.   As to claims 97 and 108, see the rejection of claim 25.

84.   As to claims 99 and 110, see the rejection of claim 28.

85.   As to claim 100, see the rejection of claim 29.

86.   As to claim 107, see the rejection of claim 38.

87.   **Claims 13,51 and 87 are rejected under 35 U.S.C. 103(a) as being**

unpatentable over U.S. Pat. No. 6,421,739 B1 to Holiday in view of U.S. Pat. No.

6,401,216 B1 to Meth et al. as applied to claim 12 above, and further in view of

U.S. Pat. No. 6,480,862 B1 to Gall.

88.   As to claim 13, Holiday as modified is silent with respect to the method of claim

12, wherein the non-volatile memory is a flash memory, wherein the store heap

comprises a plurality of cache lines, and wherein each of the sections of the store heap

comprise one or more of the plurality of cache lines.

89.   Gall teaches the method of claim 12, wherein the non-volatile memory is a flash

memory, wherein the store heap comprises a plurality of cache lines, and wherein each

of the sections of the store heap comprise one or more of the plurality of cache lines

(figure 2 (Computer 30) Col. 4 Ln. 50 – 67, Col. 5 Ln. 1 – 12).

90.   It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine the teachings of Gall and Holiday because the teaching

of Gall would improve the system of Holiday by facilitating data swapping between

memories (Col. 4 Ln. 50 – 67).

91.   As to claims 51 and 87, see the rejection of claim 13.

92.   Claims 17,31,55,69,91 and 102 are rejected under 35 U.S.C. 103(a) as being

unpatentable over U.S. Pat. No. 6,421,739 B1 to Holiday in view of U.S. Pat. No.

6,401,216 B1 to Meth et al. as applied to claim 15 above, and further in view of

U.S. Pat. No. 5,802,267 to Shirakihara et al.

93.   As to claim 17, Holiday as modified is silent with reference to the method of claim 15, wherein the execution of the virtual machine within the device is not stopped between said stopping the process execution on the virtual machine and said resuming the process execution on the virtual machine.

94.   Shirakihara teaches the method of claim 15, wherein the execution of the virtual machine within the device is not stopped between said stopping the process execution on the virtual machine and said resuming the process execution on the virtual machine ("...continue operating..." Col. 8 Ln. 56 – 67).

95.   It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Shirakihara and Holiday because the teaching of Shirakihara would improve the system of Holiday by providing fault tolerant processing (Col. 8 Ln. 56 – 67).

96.   As to claims 31,55,69,91 and 102, see the rejection of claim 17.

97.   Claims 27,41,65,79,98 and 109 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 6,421,739 B1 to Holiday in view of U.S. Pat. No. 6,401,216 B1 to Meth et al. as applied to claim 25 above, and further in view of U.S. Pat. No. 6,622,263 B1 to Stiffler et al.

98.   As to claim 27, Holiday as modified is silent with respect to the method of claim
25, wherein said reading the stored state of the process from the persistent store
comprises: reading the one or more pages from the virtual heap in the persistent store,
and wherein said reconstituting the state of the process on the virtual machine
comprises: establishing on the virtual machine a second in-memory heap for caching
pages for use by the process and copying the one or more pages read from the virtual
heap to the second in-memory heap.

99.   Stiffler teaches the method of claim 25, wherein said reading the stored state of
the process from the persistent store comprises: reading the one or more pages from
the virtual heap in the persistent store, and wherein said reconstituting the state of the
process on the virtual machine comprises: establishing on the virtual machine a second
in-memory heap for caching pages for use by the process and copying the one or more
pages read from the virtual heap to the second in-memory heap (Col. 7 Ln. 33 – 47,
figure 5 Col. 8 Ln. 41 – 64).

100.   It would have been obvious to one of ordinary skill in the art at the time the
invention was made to combine the teachings of Stiffler and Holiday because the
teaching of Stiffler would improve the system of Holiday by providing fault tolerant
processing (Col. 8 Ln. – 64).

101.   As to claims 41,65,79,98 and 109, see the rejection of claim 27.

Conclusion

102.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

U.S. Pat. No. 4,742,447 to Duvall et al.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Charles E Anya whose telephone number is (703) 305-

3411. The examiner can normally be reached on M-F (8:30-6:00) First Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, An Meng-Ai can be reached on (703) 305-9678. The fax phone number for

the organization where this application or proceeding is assigned is 703-872-9306.

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